

(Tsuchiya). These rejections are respectfully traversed. Applicants respectfully request reconsideration and allowance of the claims in view of the following arguments.

The present invention and the cited references were discussed in detail in Applicants' Amendment of December 28, 2000. For convenience, Applicants refer the Examiner to that discussion.

Regarding the obviousness rejection of independent claims 1, 18, and 37, it is contended in the Office Action that it would have been obvious to combine Takagi's defect inspection and classification technique with Broude's teaching of inspecting for defects, mapping and counting the defects and generating a signal when a threshold number of defects of a particular size and/or at a particular location are found, to thereby yield the invention of claims 1, 18 and 37.

Applicants disagree, and submit that a skilled artisan would not have been motivated to incorporate Broude's teaching into Takagi's system as suggested by the Examiner. The purpose of Takagi's semiconductor device defect classification system is to extract feature data of the defects based on their classification, feed back this information to improve the automatic inspection process, use this information to determine the cause of the defects, and control the manufacturing machinery accordingly, to avoid further defects and improve yield. These functions are explained in Takagi at, for example, col. 5, line 27 to col. 6, line 9 with reference to Fig. 1.

Broude relates to a photolithographic mask (or "reticle") inspection system wherein when a threshold number of reticle defects of a particular size at a particular location is exceeded, the inspection is interrupted and the operator informed, so that time is not wasted continuing inspection of a low-quality reticle (see, e.g., col. 5, lines 47-67).

In other words, Broude's system is for efficiently discovering and rejecting reticles that do not meet predetermined quality standards.

Tagaki's purposes would not be furthered by Broude's defect counting and signaling technique. Broude's approach to inspection is much different (and more primitive) than Tagaki's, and is used in a different context. Broude's technique is for inspecting completed masks before they are used in production to weed out low-quality masks (i.e., a "go -no go" test). In contrast, Tagaki improves product yield during production by using defect feature data from the inspection process to improve its inspection process, to determine the cause of the defects, and to adjust the operating parameters of its manufacturing machinery to prevent further defects. None of these functions are performed by Broude's inspection methodology, and none of Tagaki's goals would be served by modifying it with Broude's defect counting and display/inspection shutdown technique. Moreover, there is no objective teaching in Tagaki's yield improvement methodology relating to Broude's functions of defect counting resulting in inspection shutdown, or vice versa. Therefore, a skilled artisan would not have been motivated to add Broude's defect counting and display/inspection shutdown technique to Tagaki's inspection system to yield the invention of amended claims 1, 18 and 37.

It is stated at page 4 of the Office Action that a skilled artisan would have been motivated to incorporate Broude's counting and display/shutdown features into Tagaki's inspection system to "provide an apparatus that will either complete the process or cease the process". However, there is no support in either reference for this contention. As discussed above, Broude teaches counting defects, displaying the results and shutting down the inspection process to reject a low-quality reticle, not to improve manufacturing

yield. Broude's process is not used for in-process inspection, where yield is an issue, but rather is used after completion of a reticle and before production using the reticle begins.

Moreover, stopping or slowing down the process to improve yield is not taught or even suggested as a desirable action in Tagaki. Rather, Tagaki arguably teaches away from such action by teaching the use of its inspection results to determine the causes of defects and to adjust the production parameters accordingly, thereby improving yield. Furthermore, Takagi teaches selecting and segregating defective products for repair by an automatic or manual "repair unit" (see col. 6, lines 39-59). Takagi's production line does not need to be slowed or stopped, as suggested in the Office Action, since Tagaki teaches an alternative technique for dealing with defective products. Such action would defeat the purpose of Tagaki's automated inspection/repair/process control system. It is well-established that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed.Cir. 1984); *In re Ratti*, 270 F.2d 810 (CCPA 1959)(If a proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious); MPEP § 2143.01.

The Examiner is using improper hindsight here, using the Applicants' disclosure (of their motivation for making the invention) against them. There is no objective teaching in the art offered in support of the Office Action's stated motivation to combine the references. Thus, the statement in the Office Action offered to show motivation to

combine Tagaki and Broude to yield the claimed invention is speculative, and cannot support a rejection under 35 U.S.C. § 103.

Consequently, independent claims 1, 18 and 37 are patentable, as are claims 2, 3, 6, 7, 8, 18-20, 23-25, 35, 36, 38 and 40-42, which depend from claims 1, 18 and 37.

Regarding the rejection of independent claim 46 based on Tagaki and Broude, neither cited reference teaches or suggests the important recited step of imaging with both an SEM and an optical imager. Both references teach optical imaging only, and do not mention SEM imaging or the claimed combination of SEM and optical imaging. See Tagaki col. 15, line 15 et seq. and Fig. 19; Broude col. 6, line 29 to col. 8, line 32. Since neither reference teaches or suggests the above-discussed SEM/optical imaging step of claim 46, any combination of Tagaki and Broude, however made, would still be missing this step, and it would not have been obvious to add this step to any Tagaki/Broude combination.

Consequently, claim 46 is patentable, as is claim 47, which depends from claim 46.

Regarding the obviousness rejection of dependent claims 43-45 based on Tagaki, Broude and Shahar, the Shahar reference does not furnish the necessary motivation to combine Tagaki and Broude to yield the apparatus of independent claim 37, from which claims 43-45 depend.

Consequently, claims 43-45 are patentable.

Regarding the obviousness rejection of independent claim 48 based on Tagaki, Broude and Tsuchiya, the Tsuchiya reference does not furnish a teaching or suggestion of the important step of imaging with both an SEM and an optical imager of independent

claim 46, from which claim 48 depends, missing from Tagaki and Broude. Thus, any combination of Tagaki, Broude and Tsuchiya, however made, would still be missing this step, and it would not have been obvious to add this step to any Tagaki/Broude/Tsuchiya combination.

Consequently, claim 48 is patentable.

Reconsideration and withdrawal of the rejection of claims 1-3, 6-8, 18-20, 23-25, 35-38 and 40-48 under 35 U.S.C. §103(a) are respectfully requested.

Accordingly, it is believed that all pending claims are now in condition for allowance. Applicants therefore respectfully request an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

To the extent necessary, if any, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted

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